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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,339	10/02/2006	Johanna Buchert	Q95484	9733
23373	7590	11/23/2010		
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			EXAMINER CALANDRA, ANTHONY J	
			ART UNIT 1741	PAPER NUMBER
			NOTIFICATION DATE 11/23/2010	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/583,339

Applicant(s)

BUCHERT ET AL.

Examiner

ANTHONY J. CALANDRA

Art Unit

1741

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 18-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS/US)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

Detailed Office Action

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/27/2010 has been entered.

Claims 17 and 24 have been cancelled. Claim 1 has been amended. Claims 1-16 and 18-23 are currently pending.

Response to Arguments

In light of amendment the examiner has withdrawn the rejections based upon PEDERSEN in view of LIEBLER. Neither patent document discloses the chemical bonding via covalent bonding of modified fiber with the thermoplastic/thermosetting hydrophobic polymer.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1-16 and 18-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claim has been amended to state that the thermosetting/thermoplastic hydrophobic polymer is chemically bonded with the modified fiber. This is not supported by the specification.

The specification does not appear explicitly mention covalent bonding.

The specification mentions bonding in multiple locations however this bonding is in relation to the modifying compound with the lignocellulosic fiber [2007/0164468 paragraphs 0026-0029, 0043, 0045, 0048, 0064, 0067-0070]. None of these aforementioned paragraphs teach or suggest that the hydrophobic polymer is then bonded to the modified fiber.

The applicant points to page 9 of the specification as filed for support. However, page 9 while discussing chemical bonding, discusses these process in relation to the *modifying agent* and not the thermosetting/thermoplastic hydrophobic polymer. It does not discuss attaching and more specifically covalently bonding the hydrophobic polymer to the modified fiber.

The specification only suggests making fiber hydrophobic such that they are compatible with the fiber [0013, 0069-0070]. For example hydrophobic components are more compatible with other hydrophobic components while hydrophilic components are more compatible with other hydrophobic components. Hydrophilic compounds are less compatible with hydrophobic compounds (for example oil and water).

In the applicant's arguments dated pg. 8, the arguments appear to recognize that the chemical bonding relates to the chemical bonding of modifying hydrophobic components to the fibers via a chemical bond and that the modified fibers improve adhesion. This argument does not appear to suggest that the hydrophobic polymers are covalently chemically bonded to the modified fiber as currently claimed.

As discussed in the Amendment dated December 17, 2009, the presently claimed invention renders the fibres hydrophobic by attaching to them a hydrophobic component via a chemical bond using a radical mechanism either directly or via a tag which improves adhesion of the fibres with hydrophobic composite polymers. The presently claimed invention relates to covalent bonding and can be used with both untreated fibres as well as fibres treated with ferulic acid.

Claims 2-26 and 18-23 depend upon claim 1 and are similarly rejected.

2. Claims 18 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 states that oxygen containing gases are selected from the group consisting of air and hydrogen peroxide. Hydrogen peroxide is not a gas. Claim 19 depends from claim 18.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5-8, 11, 18-20, and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by, *A review on Interface Modification and Characterization of Natural Fiber Reinforced Plastic Composites* by GEORGE et al. hereinafter GEORGE

As for claims 1-3, GEORGE discloses treating natural lignocellulosic materials [pg. 1472 column 1 Table 1 and section 2] with a modification agent comprising two functional groups, multifunctional silane, X₃Si-R [pg. 1474 column 1 section 5.2.1] which bonds to the cellulosic

material surface. This treatment allows for better bonding with thermoplastics [pg. 1472 column 2 section 4].

The silane modifying agent has multiple functional groups; the first functional group, X, can react with hydroxyl groups on the celluloses surface. The second group, R, is compatible with the resin. GEORGE discloses aminopropyl as one of the functional R groups. GEORGE further discloses the presence of organic peroxides which are oxidants.

GEORGE states that the R group forms a covalent bond with the polymer [pg. 1474 column 1 section 5.2.1].

As for claims 5, 6, and 23 GEORGE discloses an aminopropyl group [pg. 1474 column 1 section 5.2.1]. A propyl group is a chain of three carbon atoms.

As for claim 7, GEORGE discloses that the first functional group can be methoxy or ethoxy groups which are carboxy groups [pg. 1474 column 1 section 5.2.1].

As for claim 8, GEORGE discloses that there are 3 first functional X groups present [pg. 1474 column 1 section 5.2.1].

As for claim 11, GEORGE discloses that dispersion aids can be added, thus the modifying agent is added in the form of a dispersion [pg. 1474 column 1 section 5.2.1 second paragraph].

As for claims 18 and 19, GEORGE discloses the addition of organic peroxides. Peroxides degrade into oxygen gas and water.

As for claim 20, GEORGE discloses organic peroxides [pg. 1474 column 1 section 5.2.1 second paragraph].

As for claim 22, the reaction sequences are carried out sequentially [pg. 1474 column 1 section 5.2.1 first paragraph].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over *A review on Interface Modification and Characterization of Natural Fiber Reinforced Plastic Composites* by GEORGE et al. hereinafter GEORGE.

As for claim 4, GEORGE states that the fibers are in a solvent and the fibers are dried [pg. 1474 column 1]. This suggests that the fibers are in a suspension. As the fibers are not dried the consistency is less than 95% (air dried paper has a consistency of about 90%). However, GEORGHE does not disclose the exact consistency of the suspension. At the time of the invention it would have been obvious to the person of ordinary skill in the art to optimize the concentration of the fibers within the water through routine experimentation within the broad range claimed by the applicants.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Compatibilization of Biomass Fibers with Hydrophobic Materials by KRISHAN et al.
Lignocellulose Processing with Oxidative Enzymes by GRONQVIST et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Daniels can be reached on (571) 272-2450. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anthony J Calandra/
Examiner, Art Unit 1741

/Matthew J. Daniels/
Supervisory Patent Examiner, Art Unit 1741